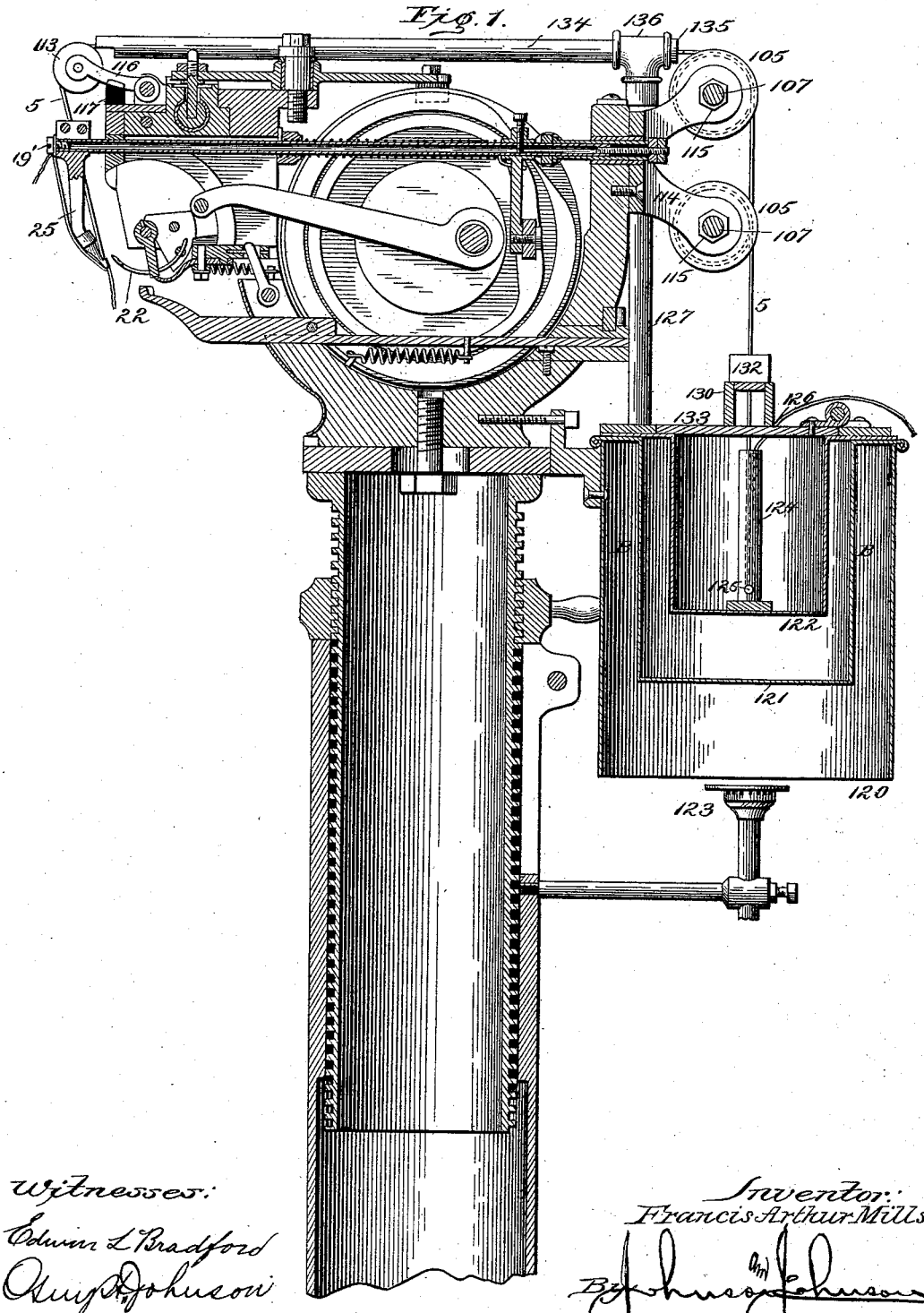
(No Model.) 4 Sheets—Sheet 1.

F. A. MILLS.

WAXING AND HEATING DEVICE FOR SHOE SEWING MACHINES.

No. 524,334. Patented Aug. 14, 1894.

Fig. 1.



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His Attorneys

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Fig. 2.

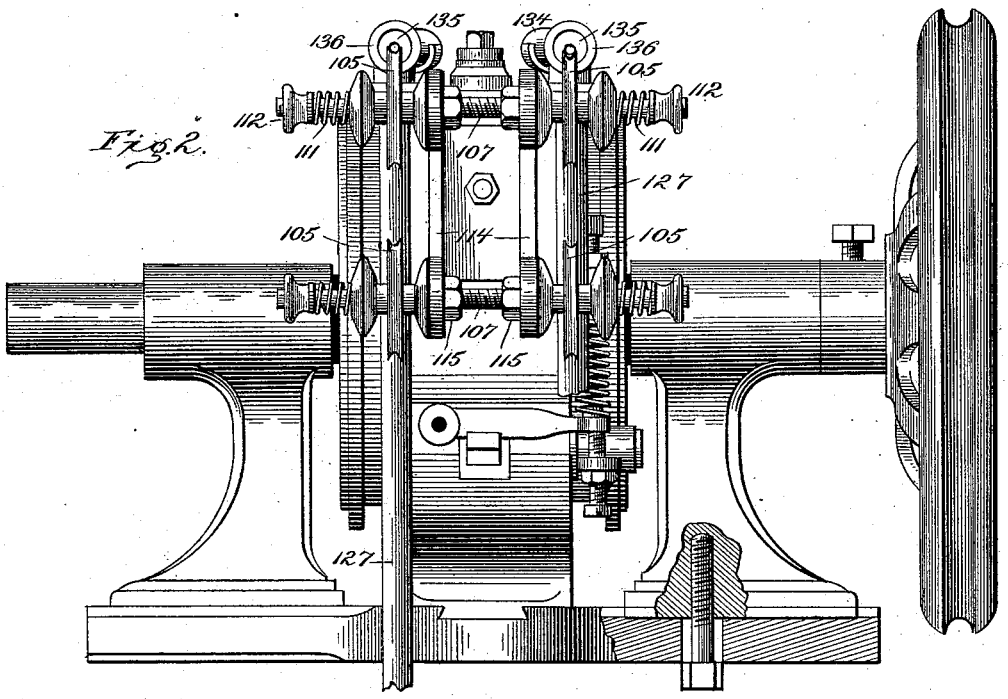
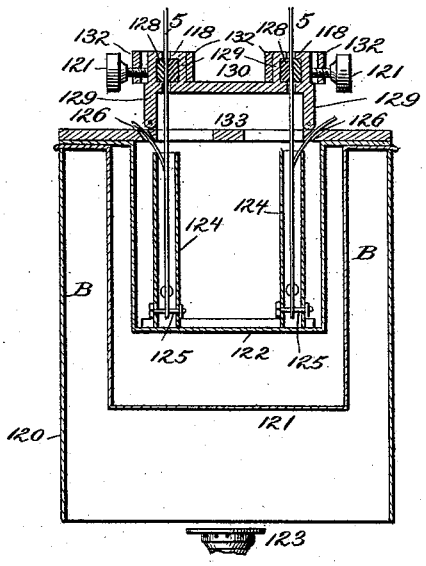


Fig. 6.



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(No Model.) 4 Sheets—Sheet 3.

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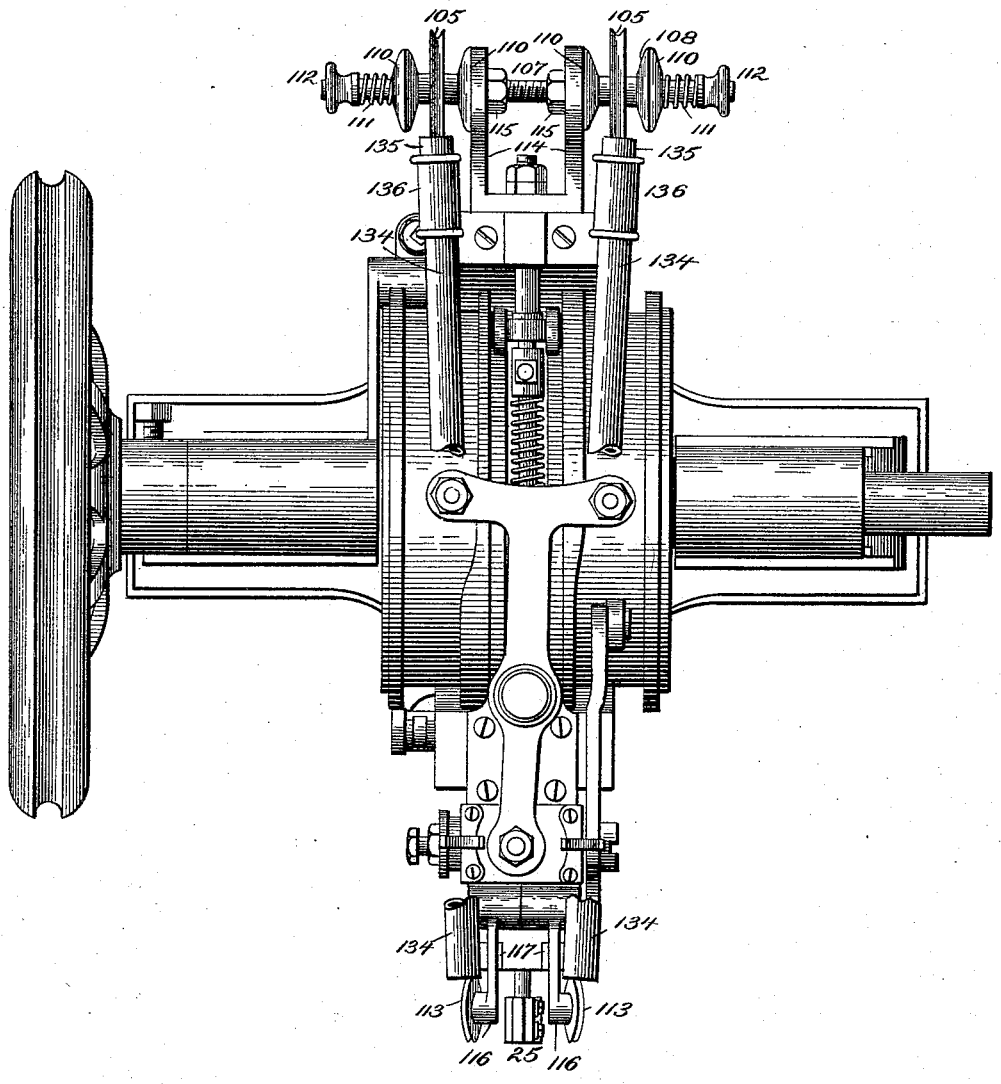
Fig. 3.



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WAXING AND HEATING DEVICE FOR SHOE SEWING MACHINES.

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Fig. 4

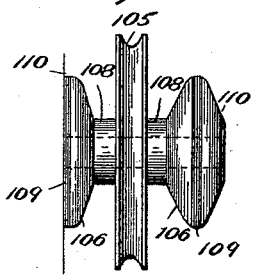
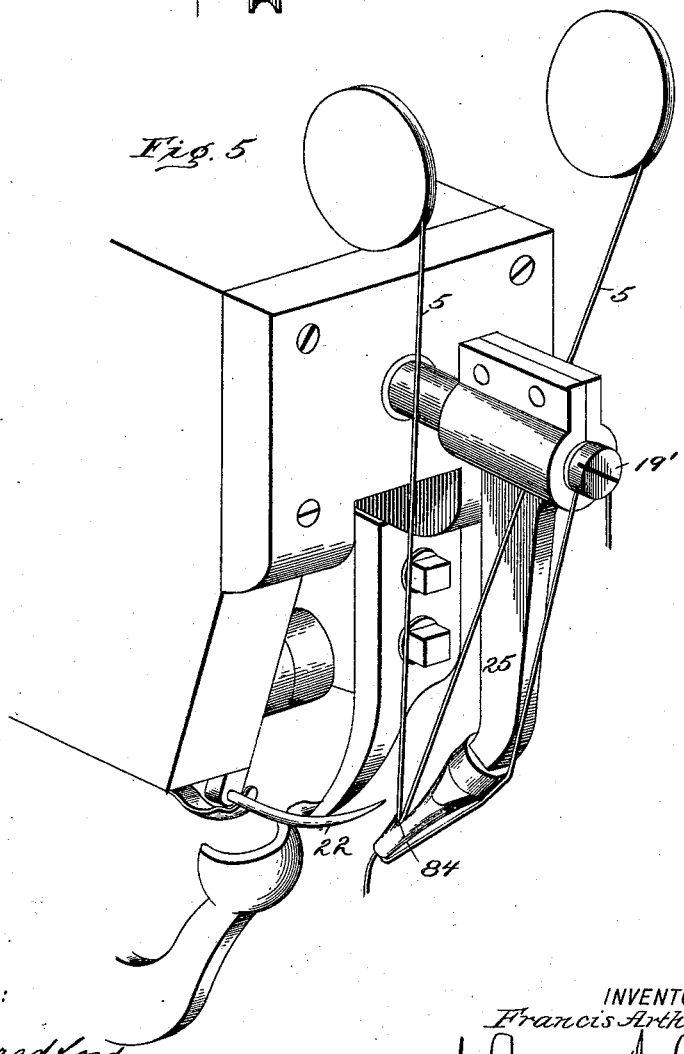


Fig. 5



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UNITED STATES PATENT OFFICE.

FRANCIS ARTHUR MILLS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO JAMES MUNDELL, OF SAME PLACE.

WAXING AND HEATING DEVICE FOR SHOE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 524,334, dated August 14, 1894.

Application filed January 28, 1893. Renewed November 8, 1893. Serial No. 490,383. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States, and a resident of the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Waxing and Heating Devices for Shoe-Sewing Machines, of which the following is a specification.

The invention claimed herein is directed to improvements in devices for waxing and heating the thread in shoe sewing machines, wherein a curved barbed needle is employed, and in which the operator presents and manipulates the article to devices which support and feed it; and my said invention consists in certain novel parts and combinations of parts hereinafter specifically set forth in the claims concluding this specification. Before specifying such claims I will describe my improved thread waxing and heating devices illustrated in the drawings.

The following description read in connection with the drawings will enable any one skilled in the art to which my invention relates to understand its nature and to practice it in the form in which I at present prefer to employ it.

Referring to the drawings: Figure 1 represents in vertical section a shoe sewing machine having my improved waxing and heating devices for the thread. Fig. 2 is a rear elevation of the tension and heating devices and so much of the machine on which they are mounted. Fig. 3 is a top view of the same. Fig. 4 shows one of the tension wheels and its tension disks. Fig. 5 shows so much of the sewing head of the machine and the sewing mechanism as illustrates the improvement of two separate and distinct threads for independent use with the looper and the needle for light and for heavy work; and Fig. 6 shows in vertical section the heating and waxing appliance for the two separate and distinct threads.

As the invention claimed herein relates to the devices for waxing and heating the thread for shoe sewing machines and their adaptation for two separate and distinct threads for independent use with a looper and needle, I have illustrated in the drawings so much of a shoe sewing machine as shows the use of the two separate threads and their relation to the waxing appliance, the tension device, and the heating conduits for the separate threads.

It will be understood that the invention claimed herein is applicable to any shoe sewing machine designed for use with waxed threads.

The waxing and heating appliance is attached to the rear side of the machine by a bracket as in Fig. 1, and is adapted to waxing and heating two separate and independent threads. The device consists of a drum 120 open at its bottom and from its closed top depends a water chamber 121 and within this chamber the wax pot 122 hangs in the water.

A gas burner 123 under the open drum serves to heat the water chamber, the heat from which keeps the wax liquid. Two tubes 124, Fig. 6, open at both ends are placed within the wax pot, and at its lower end each tube has a cross-pin 125, so that the separate threads 5, 5, from the separate balls, are passed down through separate top openings 126 into each tube around its bottom pin 125 and up through a wax stripper 118 to the tension device 105 from which it passes into and through heating tubes 134 to the looper 25 and to the needle 22.

A wax stripper is placed over each opening through which the thread passes from the wax pot, and this stripper consists of two flat pieces of rubber 128 between which the thread passes and is stripped of its surplus wax. These rubber pieces are held between jaws 129 one of which is pivoted to a top housing 130 and is pressed with its rubber against the fixed rubber piece by a thumb screw 131 which passes through one end of an open box or band 132 which surrounds the jaws, so that the screw bearing upon the pivoted jaw puts the proper pressure upon the strippers from which the thread is drawn with the proper tautness and properly waxed. These strippers are arranged in a housing 130 fixed on a hinged cover 133 which is opened to supply the wax pot.

Communicating with the hot air space B of the heating drum are two vertical tubes

127 which open directly into separate horizontal branch tubes 134 at the top of the machine, and which are open at both ends. The front ends of these top branch tubes terminate at the cushion guide wheels 113, while a screw plug 135 in the rear end of each top tube has a hole large enough to allow the thread to pass through it from the top tension wheel 105. These top pipes 134 are thus made to form closed heating conduits for the separate threads 5, 5, and to keep them moist and soft as they pass to the looper for separate use. These top heating conduits have each a swiveling connection by a T-coupling 136 with the vertical branches which permits the top tubes to be turned out for access to the interior machine parts when required.

The tension device is mounted upon the rear of the machine between the inner ends of the top heating conduits and the thread strippers, and I have shown the separate threads as being supplied to the separate tension wheels 105 from the waxing and heating device to the looper of a sewing machine. The tension device for each separate thread consists of a pair of single grooved tension wheels 105 arranged one above the other each mounted loosely upon a horizontal shaft 107 fixed in a suitable bracket 114. Each friction wheel has a sleeve 108, see Fig. 4 which projects from the opposite sides of the tension wheel and has a disk 106 on each end which stands away from the wheel and engages a suitable friction surface such as felt 109, which forms the facing of a co-acting surface 110 and which latter has a spring 111 on said shaft to maintain the frictional contact of the disks. A nut 112 on the shaft serves to regulate the tension on the friction surface and of the thread.

The placing of the friction disks on the ends of the sleeve 108 is to remove them from the wheel and thus prevent the friction pads from being gummed with dripping wax which would to a great extent interfere with the proper tension and feed of the thread and give the operator much trouble; for, in wax thread machines the tension wheels are kept hot from the thread as it comes from the hot wax pot, and the wax will gather on the wheels and run or drip over them upon the friction pads so that the pads have to be removed and replaced by new ones frequently from this cause. The thread is wrapped once around each friction wheel from the lower to the upper one from their rear peripheries, and from the upper tension wheel it passes through the heating conduits over the cushioned guide wheels 113 at the front of the machine to the looper. By using a pair of tension wheels the pressure of the tension spring is about one half for each wheel of what would be required for one tension wheel and this divided tension force prevents the slipping of the thread which occurs under the pulling action of the needle, with one wheel adjusted to give the required tension. The slipping of the thread is attended with the objection of not putting the proper tension in the stitches whenever the thread should slip. The thread is kept under uniform tension as it is drawn from the wax stripper; while the cushion guide wheel maintains the proper tension on the thread as it passes to the looper. The winding of the thread once around the wheels and the use of two wheels allow only half of the full tension to be put upon each wheel by the thumb screw and this permits the tension wheels to turn loosely on their shafts before the thread would slip, as the thread would have a greater friction on the wheel than the spring would put upon the felt.

I secure the shafts of the tension wheels to a bracket 114 by jam nuts 115 so that the shafts cannot turn. To allow the thread to have a yielding feed to the looper the guide wheel is mounted upon a pivoted arm 116 which rests upon a cushion 117.

In sewing shoes of light and heavy stock it is the practice to change the thread to suit the different work and in doing this the thread must be cut at a point outside the wax pot in order to join it with a lighter or heavier thread as may be required for the work. In doing this the cut part of the thread is tied to the new thread and the latter is drawn through the machine and the cut part of the thread is thrown away. The time of the operator is lost in passing the new thread into the machine and adjusting the tension to suit the work. This is troublesome and the handling of the thread smears the operator's hands with wax, and this changing the threads is otherwise objectionable. To save all this trouble, loss of time, and inconvenience, I provide the machine with tension devices for two different threads suited for light and for heavy stock and the thread from each pair of single groove friction wheels is delivered over the machine at each side of the looper arm. Both these threads are passed through the looper finger-bore 84 where they are held for separate and independent use. The end of that thread which is not in use is held out of the way at the upper end 19′ of the looper arm, as seen in Figs. 1 and 5. The tension having been adjusted for the two threads for different work, they are always in readiness for use, require no changing, and give a uniform tension for all work of the same class, and these advantages are obtained by the employment of two independent and different threads each having an independent tension suited to the work.

The arrangement of the thread conduits at the top of the centerhead, and the arrangement of the waxing and heating appliances at the rear side of the machine keep the machine comparatively cool, while the threads are heated and kept soft and pliable and delivered at the front of the machine. This arrangement of the thread conduits also permits the tension device, and the waxing and

heating appliances to be placed at the rear of the machine and in position to deliver the waxed threads directly into the rear ends of the heating conduits and heated air into these conduits at the point at which they receive the threads. In this arrangement it is important to notice that the vertical air conduits open into the horizontal air conduits and deliver therein a volume of hot air in direct contact with the thread; and that the ends of these top air conduits at which the threads enter are practically closed against the entrance of cold air, so that the hot air passes directly from the heating chamber B into the closed air conduits and thus the fullest effect of the heat on the threads is obtained without heating the machine. This advantage is obtained by joining the vertical tubes just in advance of the ends at which the threads enter the thread-heating tubes.

I have illustrated in the drawings the invention claimed herein in connection with a complete shoe sewing machine, but as to all matters of devices and of the combinations of such devices embraced in said machine other than those which belong to and are covered by the invention claimed herein, they are embodied in separate and distinct applications, Serial Nos. 491,159, 491,160, 491,442, 490,965, and 491,443, for patents filed by me and are therefore not claimed herein.

Referring to the thread tubes 124, their use gives the advantage of isolating the thread from the body of the wax in the pot, forms an inclosed guide for the thread and causes it to pass through a comparatively small body of wax in communication with the pot within which the wax is supplied in the solid and melted. The importance of these thread tubes is seen in the event of the wax becoming low in the pot and it is necessary to melt more wax, the tubes protect the thread from contact with the wax as it is being melted, and the operation of the machine need not be suspended for melting the wax.

I claim as my invention in thread waxing and heating devices for shoe-sewing machinery—

1. The top horizontal thread conduit and a vertical conduit for heated air united to said thread conduit by a swiveling coupling, in combination with a tension device, a wax pot, and an air heating chamber, whereby the thread conduit may be turned outward for the purpose stated.

2. The combination, with a wax pot, and a heating chamber, of two separate and distinct thread strippers, two separate and distinct tension devices, two vertical heat conduits, two horizontal thread conduits communicating with said heat conduits, a looper receiving and retaining both threads, and means for holding one of said threads out of use without interfering with the use of the other thread, whereby two separate and different threads are held in readiness for use with the same looper and needle for different work.

3. In a shoe sewing machine, the combination, with a vibrating looper arm, of two horizontal thread conduits closed against the entrance of air at their thread receiving ends, two heat conduits separately communicating with said thread conduits, a tension device for each thread, and suitable waxing and heating appliances, whereby both threads are kept waxed and heated in readiness for separate use with said looper.

4. In a sewing machine using waxed threads, the wax pot provided with a fixed interior tube 124 open at both ends, its lower end having a cross pin 125 and forming a closure and guide for the thread, in combination with the water chamber 121 and the heating drum 120, whereby the thread is isolated from the body of the wax in the pot.

In testimony whereof I have hereunto signed this specification in the presence of witnesses.

FRANCIS ARTHUR MILLS.

Witnesses:

A. E. H. JOHNSON,

PHILIP F. LARNER.